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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,605	06/28/2001	Hiroyuki Sasai	2001_0928A	4838

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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/892,605	SASAI ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20, 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto et al. ("Seto") (US Patent Application Publication No. 2003/0035183) in view of Palmer (US Patent No. 6201820).

Regarding claim 20, Seto discloses an optical transmission apparatus for transmitting an optical signal via an optical fiber to a radio base station which photoelectrically converts the optical signal into a radio signal having a predetermined frequency and transmits the radio signal to a subscriber terminal (fig. 15 and paragraphs 0001, 0030 and 0197-0202), the optical transmission apparatus comprising: an electrical-optical converter operable to convert an intermediate frequency signal into an optical signal by intensity-modulation (fig. 15, element 18); a local oscillation signal source operable to output a local oscillation signal (fig. 15, element 14-1 or 14-2); wherein an intensity modulation component of the optical signal has a frequency component of the radio signal (paragraphs 0030 and 0200-0202). Seto discloses using a local oscillation signal to upconvert a radio signal for optical transmission (paragraphs 0030-0034, 0075 and 0076, as applicable to fig. 15 embodiment), but does not disclose an external modulator operable to intensity modulate the optical signal using the local oscillation signal. Palmer discloses upconverting a radio signal for optical transmission by first directly modulating

a laser with an RF signal to be transmitted and then externally modulating an oscillator signal onto the optical signal (fig. 5 and col. 11, line 45 to col. 13, line 44 and col. 14, lines 26-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the direct laser modulation technique followed by external modulation of Palmer in the system of Seto, since they are both drawn to solving the problem of upconverting RF signals for optical transmission.

Claim 21, the combination of Seto and Palmer discloses the optical transmission apparatus according to claim 20, wherein said electrical-optical converter is operable to convert a plurality of intermediate frequency signals into the optical signal by intensity modulation (Seto: fig. 15, elements f.sub.LF1 to f.sub.LFp as applicable in the combination).

Claim 23, the combination of Seto and Palmer discloses the optical transmission apparatus according to claim 20, wherein said electrical-optical converter is a semiconductor laser for converting the intermediate frequency signal into an electrical-optical converted optical signal through direct modulation (Palmer: fig. 5, element 176 as applicable in the combination).

3. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto et al. ("Seto") (US Patent Application Publication No. 2003/0035183) in view of Palmer (US Patent No. 6201820) as applied to claims 20, 21 and 23 above, and further in view of Ooi et al. ("Ooi") (US Patent No. 6362913).

Claim 22, the combination of Seto and Palmer the optical transmission apparatus according to claim 20, wherein said external modulator is a lithium niobate type external modulator (Palmer: fig. 5, element 178 and col. 12, lines 8-18). The combination does not explicitly disclose that the external is a Mach-Zehnder type modulator or that a bias point in said Mach-Zehnder type external modulator is set to a point at which light output power is a minimum

or a maximum so that the optical signal is intensity-modulated by a component which is twice a frequency of the local oscillation signal. Ooi discloses an external lithium niobate modulator as a Mach-Zehnder type modulator (col. 1, line 55 to col. 2, line 11) and discloses details on the conventional behavior of a Mach-Zehnder external modulator and disclose that when the bias of the modulator is at an optimum level, the output signal is modulated by a component that is twice the frequency of an oscillation modulation signal (fig. 35 and col. 3, lines 42-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a Mach-Zehnder type modulator for the lithium niobate modulator of the combination of Seto and Palmer and to then set the bias of the external modulator of the combination of Seto and Palmer to the optimum value in order to produce the optimum output as taught by Ooi.

Response to Arguments

4. Applicant's arguments submitted on 21 December 2005 have been considered but they are not persuasive. The applicant argues that the pilot carrier of Seto cannot be used to optically modulate an optical RF data signal because the pilot carrier signal is indispensable to the downstream receiver devices. The use of the pilot carrier signal at the downstream receiver is not relevant to whether or not the pilot signal can be combined optically with an already optical RF data signal as opposed to electrically combined with an electrical RF data signal (and then converted to optical). In light of the new grounds of rejection, Palmer demonstrates for the combination how a pilot signal can be used to externally optical optically modulate an optical RF data signal.

Conclusion

5. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JASON CHAN
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